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(11) **EP 1 028 395 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:  
16.08.2000 Bulletin 2000/33

(51) Int. Cl.<sup>7</sup>: **G07C 5/08**

(21) Application number: **00101437.2**

(22) Date of filing: **25.01.2000**

(84) Designated Contracting States:  
**AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU  
MC NL PT SE**  
Designated Extension States:  
**AL LT LV MK RO SI**

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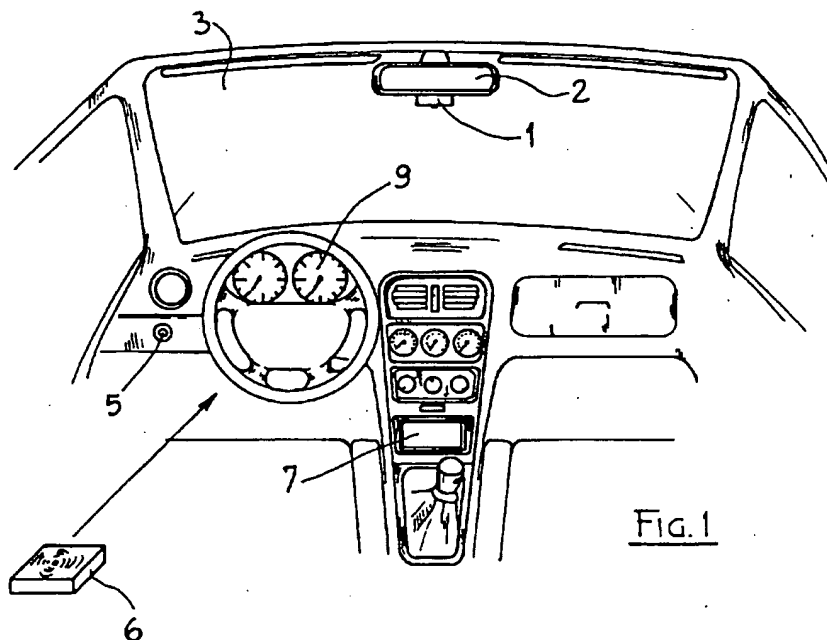
(30) Priority: **09.02.1999 IT RE990019**

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(54) **Device for the temporary and/or permanent recording of sudden events**

(57) On a vehicle at least a miniaturized camera (1) is installed that has a field of view at least equal to that of the driver. When the vehicle is running, the camera records and stores (4) the images that appear before it for a prefixed period of time, after which said images are canceled from those taken after a subsequent period of

equal duration, and so on. The cycle repeats during the running of the vehicle and stops only if an external event occurs that blocks its working. When the vehicle is parked, said device can be used as an anti-breaking means.



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## Description

**[0001]** The present invention relates to a device for the temporary and/or permanent recording of sudden events that is substantially constituted by at least a miniaturized camera with the associated recording and possible audio means, that can be installed on any types of vehicles and so arranged as to have a field of view at least equal to that of the driver. When the vehicle is running, the camera records and stores the images that appears before it for a prefixed period of time, after which said images are canceled from those recorded during a subsequent period of time of equal duration, and so on. The cycle repeats indefinitely during the regular running of the vehicle and stops only at the time, or shortly after, when a possible external event occurs that can suddenly modify such running state. One or more cameras may also be installed with different orientations: towards the back of the vehicles and/or towards their access points. By the same logic, the cameras record the images comprised in their field of view and stop in case of events that modify suddenly the regular running conditions. If they are caused to work also with parked vehicles, they can record the possible breaking attempts.

**[0002]** As is known, in case of accidents, disputes arise very often between the concerned parties, especially if the facts have occurred in the absence of external witnesses. For instance, a typical case is the one associated to crashes between motor-cars that have taken place in correspondence of road-crossings controlled by traffic-lights, where each driver can state, without any fear of being belied, to have passed with the green light and that the responsibility for what has happened stays with the other driver who has passed with the red light, and nothing can be made to find how facts have actually taken place. So, in the same way as the above example, there are many occasions in which it would be very useful to have at disposal films of what has taken place some instants before, and possibly during and after the accidents, in order to have a correct and irrefutable reconstruction of the facts, to the advantage of both the people involved and the insurance companies.

**[0003]** Object of the present invention is to provide a valid means that can satisfy the above requirements. The invention, as is characterized by the claims, solves the problem by means of a device for the temporary and/or permanent recording of sudden event, whose results and advantages consist essentially in that such aboard application allows to obtain on any exceptional occasions the actual visual situation of the moment when an event has taken place, and possibly, the situation directly preceding and following said event.

**[0004]** The invention is described in detail in the following, according to an embodiment solely given by way of non limiting example, with reference to the attached drawing, wherein:

Figure 1 shows a schematic front view of a temporary recording device applied to the dashboard of a motor-car, and

Figure 2 shows the block diagram of an embodiment of a temporary recording device.

**[0005]** With reference to the figures and to a particular application made on a motor-car, solely given by way of non limiting example, once can understand how a camera (1) of a known miniaturized type, can be applied, for instance, behind the rearview mirror (2), so that its field of view is comparable to the one seen by the driver through the windshield (3). Once the dashboard of the vehicle is on, the camera starts recording the images that appear before it, and such images are automatically stored in a memory (4) that can contain, for instance 30" of recording or more or less, according to well-considered choices. When said time has elapsed, the recorded images are canceled from the start and replaced by those that are progressively recorded during the subsequent cycle of equal duration, and so on, so as to have always stored and available the recording of the images of the last 30" elapsed. The above cycle repeats indefinitely during the regular running of the vehicle, until an external event occurs that causes its interruption. Preferably, but not limitatively, the adoptable memory is a solid state non volatile memory, so as to ensure the maintaining of the images and the possible sounds also in case of lack of electric energy, and not to have magnetic tape wearing. By way of example and with reference to the case of application on a motor-car, the image recording interruption may be caused by either a manual push-button (5) activated by the driver, or, and more suitably, by a signal coming, for instance, by an accelerometer (6) or by another like instrument capable of recording anomalous behaviors of vehicles and the exactly moment of a possible sudden, unexpected and rapid variation in the conditions of regular running, such as a violent deceleration due to a sudden braking, an impact with another vehicle or obstacle, an abrupt manoeuvring or steering due to a sudden obstacle, or other behaviors anomalous with respect to the regular driving of a mobile means.

**[0006]** In such conditions, the concerned device is therefore capable of providing a film, possibly associated to an audio system, of what has happened during the moments preceding the event or during said event. The images stored in the non volatile memory (4) may be re-viewed directly on the vehicle, provided it is equipped with a display (7), for instance of the type adopted for satellite navigation, or through a suitable external reading device (8) available with authorized centers or the Traffic Police or also insurance companies which might even introduce favorable policies for the users who utilize the present device on their vehicles. Taking as a reference the example of a crash between two motor-cars near a road-crossing controlled

by road-lights, the film can irrefutably establish which car has passed with the red light and is responsible for what has happened. The same can be said for other types of accidents and/or events about which one desires to have more information.

[0007] To this aim, the system can be improved, either by adopting longer recording times or also by continuing the recording for a short time after the external event that has caused its stopping. This last solution allows to have at disposal a subsequent visual documentation of the facts that, added to the recording of the event, is to the full advantage of a more complete analysis of what has happened and the possible responsibilities.

[0008] The basic configuration of the device may also be completed by memorizing in the same way also the speed of the vehicle, an information that in most cases may prove very useful for a thorough knowledge of the way the events have taken place and the actual responsibilities of the people involved. This information is easily available, to minor costs, by a simple connection with the speedometer (9) of which all vehicles are provided. A further and advantageous improvement of the device is the insertion in the recorded images of a time reference that can provide the date and the hour of the stored event. In substance, the concerned device, possibly completed with the speed and time meters, constitutes an advantageous sort of "black box" for vehicles in general, having a cost very limited and accessible for applications of either first or second assembly.

[0009] The application of the miniaturized camera behind the rearview mirror is of course only one of the many solutions that may be adopted. Another very useful application is the one concerning the view through the rear window of vehicles, with respect to the possibility of telescoping, while the orientation of one or more cameras facing the inside, so as to cover the space of the driver's cabin and/or its accesses, may be coupled to alarm systems that, in case of an attempted breaking, activate the recording, allowing the recognition of the thief. In these applications, one only camera can be adopted for both functions; it suffices, in fact, to orient it differently, by hand or automatically, and to couple the two working types to the control or rest state of the anti-breaking system; in the same way, it is possible to utilize the different cameras towards the inside and towards the outside, exploiting in any way one only recording device. The intervention control with orientation towards the outside for running vehicles, and of anti-breaking working with orientation towards the inside for parked vehicles, may be manual by a dedicated push-button on the circuits of the device, or automatic, according to the ignition position of the dashboard. In case of intervention on the system, with automatic recording and running stop due to an external event, such as for instance a sudden and violent braking to avoid an unexpected obstacle, an involuntary skidding, a high speed curve cutting and the like, that ends however and fortunately

without damages, the device can be re-activated by the driver, utilizing the hand switch (5).

[0010] From what has been described and depending on the specific objects of the device, one understands that it can be advantageously applied on any mobile means, such as motor-cars, trucks and articulated trucks with non visible rear zones, towed means such as caravans and trailers, trams, coaches and trolley-buses for town and extra-town transport, industrial and hired motor-cars, agricultural vehicles in general, boats and so on.

[0011] While the invention has been described and illustrated according to an embodiment solely given by way of non limiting example, it will be obvious to those skilled in the art that various modifications in the forms, detail, orientations, combinations, assemblies and components may be introduced without falling outside its scope and object.

## Claims

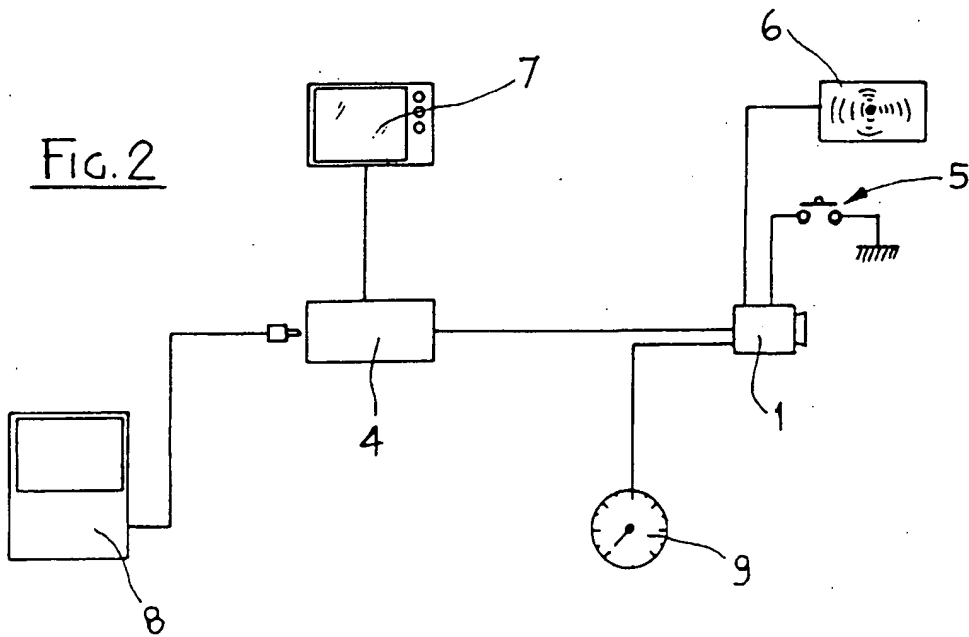
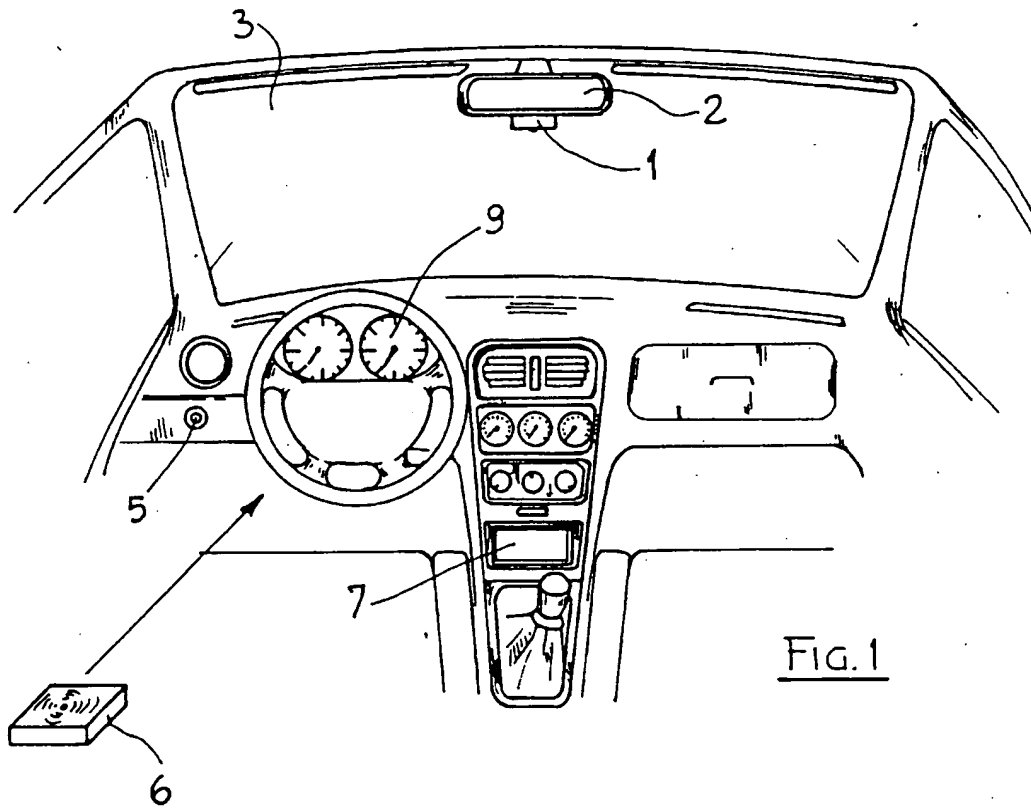
1. A device for the temporary and/or permanent recording of sudden events that can be seen on mobile means in general, characterized in that it is constituted by at least an onboard miniaturized camera (1) having a memory (4), and possibly an audio system, wherein the camera can record and store the images that appear before it, with possible sounds, for a prefixed period of time, after which said images are canceled from those taken after a subsequent period of equal duration, and so on uninterruptedly for all the time of running, with the possibility of interruption only in case of a sudden and/or violent and/or anomalous external event; said interruption taking place either by hand through a switch (5) or automatically through a sensor (6), for instance an accelerometer and/or detectors of anomalous behavior of the mobile means.
2. The device for the temporary and/or permanent recording of sudden events according to claim 1, characterized in that it executes cyclical recordings, with constant sequential intervals of time, so as to store and put at one's disposal the images before, during and possibly following an event of interest; said images being correlatable with an audio recording.
3. The device for the temporary and/or permanent recording of sudden events according to claims 1 and 2, characterized in that it is provided with a solid state non volatile memory that stores images and sounds also in case of lack of electric energy.
4. The device for the temporary and/or permanent recording of sudden events according to claims 1-3, characterized in that it operates according the movable means whereon it is installed, with the start off

caused by the ignition of the dashboard and the interruption obtained by a manual operation through switch (5) or an automatic action of a sensor (6) that senses the anomalous behavior of mobile means, or also: both operating depending on the movement of the mobile means, as said, or during the parking of said means, with ignition through a switch.

5. The device for the temporary and/or permanent recording of sudden events according to claims 1-4, characterized in that it comprises one or more miniaturized cameras (1) one of which is placed behind the internal rearview mirror (2) of a vehicle, with a field of view corresponding to that of the driver through the windshield (3). 10 15
6. The device for the temporary and/or permanent recording of sudden events according to claims 1-5, characterized in that it comprises one or more miniaturized cameras (1) one of which has a field of view related to the rear window or the back of a vehicle, either associated or non associated to another camera located behind the internal rear-view mirror (2). 20 25
7. The device for the temporary and/or permanent recording of sudden events according to claims 1-7, characterized in that it can be associated to, and capable of storing the speed of movable means through, connections with onboard instruments, and of providing the stored images with further data on the running and the state of said movable means, said data coming from sensors present onboard or to be installed onboard, in particular time indications of the date and the hour. 30 35
8. The device for the temporary and/or permanent recording of sudden events according to claims 1-7, characterized in that it comprises one or more miniaturized cameras (1), at least one of which has a field of view in the inside of the vehicle and whose recording is started off by the activation of an anti-breaking alarm and the images concern the breaking attempt. 40 45
9. The device for the temporary and/or permanent recording of sudden events according to claims 1-8, characterized in that it comprises one only miniaturized camera (1), with the associated memory (4), that can execute two functions: of external control of the movement of mobile means and of breaking internal recording. 50
10. The device for the temporary and/or permanent recording of sudden events according to claim 1-9, characterized in that it comprises two or more miniaturized cameras (1) coupled to one only device for 55

recording the images and the possible sounds.

11. The device for the temporary and/or permanent recording of sudden events according to claim 1-10, characterized in that the recorded images, with or without sounds, are visualized by a display by means of monitors present onboard of the mobile means or through special devices supplied in concession to bodies such as installers, Traffic Police, insurance companies.





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# EUROPEAN SEARCH REPORT

Application Number  
EP 00 10 1437

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	WO 96 00957 A (SISTEMI PER L INTELLIGENZA ART ;GARDIN FRANCESCO (IT)) 11 January 1996 (1996-01-11) * abstract; claims; figures * * page 4, line 5 - page 11, line 25 *	1-5,9,10	G07C5/08
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A	WO 95 28783 A (PRIMA FACIE INC) 26 October 1995 (1995-10-26) * abstract; claims; figures * * page 7, line 25 - page 11, line 10 * * page 12, line 13 - page 17, line 9 *	1-11	TECHNICAL FIELDS SEARCHED (Int.Cl.7) G07C
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The present search report has been drawn up for all claims			
Place of search <b>THE HAGUE</b>		Date of completion of the search <b>16 June 2000</b>	Examiner <b>Meyl, D</b>
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons &amp; : member of the same patent family, corresponding document</p>			

EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT  
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EP 00 10 1437

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.  
The members are as contained in the European Patent Office EDP file on  
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